FACTORS PREVENTING AFRICAN AMERICANS FROM SEEKING EARLY INTERVENTION IN THE TREATMENT OF ISCHEMIC STROKES

Dwight F. King, MD, Annapurni-Jayam Trouth, MD, and Alice O. Adams, MD, PhD
Washington, DC

The most widely advocated drug that has been developed to decrease and possibly reverse the crippling effect of stroke is recombinant tissue plasminogen activator (rt-PA). In the treatment of ischemic stroke, rt-PA must be administered within the first 3 hr after the onset of symptoms for optimal efficacy and avoidance of life-threatening cerebral hemorrhage. This study sought to determine whether African-American stroke victims presented for treatment within the first 3 hr. In the study, we identified some of the more common reasons for the lack of prompt presentation. A prospective survey of 103 randomly selected acute stroke patients was performed. We found that less than half of this population sought assistance in the emergency department in time to take advantage of rt-PA therapy. When confronted with symptoms that were consistent with acute stroke, many patients either chose to ignore them or thought that they were experiencing transient phenomena. Three factors were identified as possible reasons for the lack of prompt response: (a) a lack of information about available treatment options; (b) the inability to recognize the early warning signs of an impending stroke; and (c) denial of illness. This study may help to evolve strategies that must be instituted to better educate the community about the early recognition of stroke and available treatment alternatives. (*J Natl Med Assoc.* 2001;93: 43–46.)

Key words: African Americans ♦ stroke ♦ recombinant tissue plasminogen activator

Stroke, or cerebrovascular disease, is a syndrome caused by the impediment or cessation of blood flow to a part of the brain.[1] Ischemic strokes account for 80% of all cerebrovascular problems.[2] Approximately 50% of strokes are atherosclerotic in origin, and 30% are embolic from the heart or carotid arteries. Hemorrhagic strokes result from the rupture of blood vessels nourishing the brain, and they account for 20% of all strokes.

The death rate from strokes stood at about 106 per 100,000 population for the 50 years between 1900 and 1950.[3,4] There was an approximate decline in the death rate of 25% in the next 30 years. Between 1980 and 1995, the overall mortality rate decreased an additional 20% in all categories, including men, women, Caucasians, and African Americans.[5] Measures as basic as taking an aspirin every day, increasing population awareness, and making successful efforts to better manage hypertension have contributed to this dramatic overall decline in mortality rates.[6]

 From the Department of Neurology, Howard University Hospital, Washington, DC. Requests for reprints should be addressed to Dwight F. King, MD, 1318 Green St, Yankton, SD 57078.

Stroke is the third leading cause of death in the U.S.[7] It lags only behind heart disease and cancer in this regard. Each year, approximately 150,000 Americans die from strokes. The incidence of stroke in America is approximately 600,000 new or recurrent cases annually. Approximately 4,000,000 stroke survivors are alive today.

African-American men die from strokes at twice the rate of white men (African-American men, 52 deaths per 100,000 population; white men, 26 deaths per 100,000 population). African-American women die at a rate that is 71% greater than that of white women.[5,7]

It is ironic that, given the seriousness of these figures, a survey of 500 San Francisco Bay area residents by the American Heart Association found that 65% of respondents were unable to correctly identify even one of the early warning signs of stroke.[8] Contrary to this, 90% of respondents could name at least one indication of a myocardial infarction and a majority could name more. Twenty-nine percent of respondents could not identify the brain as the locus of ischemia when prompted with the possible choices "heart," "brain," "don't know," and "other."

A lack of recognition of the warning signs of a stroke is a global problem. In an Australian study,[9] 32% of patients with acute stroke did not present in the first 12 hr. In the United Kingdom,[10] it was estimated that 70% of all patients with strokes were managed at home and never were admitted to the hospital. A published report by Duke University,[11] conducted between 1985 and 1987, found that only 37% of patients with strokes presented within 24 hr. On a more positive note, a consortium of 14 hospitals, as part of the Neurologic Disorder and Stroke Tissue-type Plasminogen Activator Pilot Study, concluded that as many as 50% of 1159 eligible patients arrived at the hospital within 3 hr of the onset of symptoms.[12] Hacke et al. have shown that optimal efficacy is achieved if rt-PA is administered within the first 3 hr after onset of symptoms.[13] This study was undertaken to determine whether these numbers could be reproduced in the African-American population.

There are certain nonmodifiable risk factors that are associated with stroke onset, and these include: (a) older age, (b) male gender, (c) race, (d) diabetes, (e) prior stroke, (f) family history of strokes, and (g) asymptomatic carotid bruit.[14]

Some risk factors for strokes are modifiable medically, surgically, by dietary modification, by exercise, or by abstinence from harmful substances. Some of the modifiable risk factors are: (a) hypertension; (b) heart disease; especially atrial fibrillation; (c) transient ischemic attack; (d) increased red blood cell count; (e) increased serum cholesterol/lipid levels; and (f) physical inactivity/obesity.[14]

METHODS

One hundred three African-American stroke patients or reliable historians were surveyed between February 1997 and June 1999 to determine the time lapse between the onset of symptoms consistent with an acute stroke and the effort to seek medical attention. An effort to obtain medical attention was defined as calling 911 for emergency medical attention, phoning a physician, or utilizing private means to go to a hospital. Studies have measured the time from symptom onset to hospital arrival.[15,16] Symptoms considered to be consistent with a stroke included the following:

- sudden onset of weakness or numbness of the face, arm, or leg;
- sudden dimness or loss of vision, particularly in one eye;
- sudden difficulty in speaking or understanding speech;
- sudden severe headaches with no known cause; and
- unexplained dizziness or unsteadiness, or sudden falls, especially accompanying any of the other signs.

These criteria are in conformity with the National Institute of Neurological Disorders and Stroke.[12]

The survey tool consisted of six questions as follows:

1. Which symptoms did you experience when you first believed something was wrong?
2. What did you do?
3. How long before you did it?
4. How long before you called 911 or arranged for transport to the hospital?
5. If you did not seek help immediately, why did you wait?
6. Have you heard of, or are you aware of the term "brain attack"?

Each patient received a noncontrast computed tomography scan of the head as part of his or her routine stroke workup.

This study did not distinguish between ischemic and hemorrhagic etiology. Patients or significant others who were unable to provide a time line of events were excluded from this study. Patients who could not time the onset of symptoms because they awakened with neurologic deficits also were excluded. The patients were interviewed primarily in the emergency department or after admission to the hospital during the normal course of data gathering. Informed consent was obtained. The authors interviewed and examined all participants in the study.

RESULTS

The average age of the 103 participants in this study was 57.7 years. They ranged in age from 34 to 93 years of age. Fifty-two percent were men. All of the participants had at least two risk factors for stroke. On average, patients with hemorrhagic lesions (9.7%) reported sooner than those with ischemic lesions. They reported an average of 3.48 hr after the onset of symptoms. Also, the more cataclysmic the initial neurologic deficit, the earlier the response.

On an average, it took 24.68 hr for participants in this stroke study to seek attention. The time range was 1 min to 25,920 min (or 432 hr). Two patients waited $>$ 6 months and were not included in the final analysis. Forty-nine percent of patients sought assistance within 3 hr, 54% sought assistance within 12 hr, and 83% sought assistance within 24 hr. Men reported an average of 13.6 hr in seeking assistance, and women reported an average of 36.0 hr in seeking assistance.

The reasons given for the delay in seeking assistance were numerous and were documented verbatim. This study is unique in this respect. Some of the most common reasons for delays in seeking assistance were the belief that numbness was a manifestation of diabetes, "my sugar," or resulted from sleeping in an awkward position. Some thought prayer would provide better "medicine" than their doctor. One male patient was preoccupied with leaving his car unattended. Only two participants had heard or read about the term "brain attack." Many had an intellectual concept of its meaning.

The emphasis was shifted totally to the intent of the patient to seek help and not their hospital arrival time, the factor that often has been investigated in previous studies.[17,18] The patient's attempt to seek assistance represents the one factor in an important chain of events that the patient, or a significant other, can control. It represents the rate-limiting step.

DISCUSSION

The study indicates that 97% of participants did not receive thrombolytic therapy. The primary reasons were delayed response time and the patient's inability to meet the inclusion criteria. Some patients who otherwise qualified did not receive the therapy. Institutions with the responsibility of providing care must be prepared to rapidly select eligible patients, then to diagnose and treat the patients within 3 hr of the onset of symptoms and to obtain informed consent if a measure of success is to be achieved. Having a neurologist available who works in concert with a well-trained stroke team, including emergency department personnel, and a radiologist is important.

A multifaceted public education program that utilizes mass media and other public forums would help. In the African-American community, churches represent an important education forum.

Primary care physicians have an important role to play. It has been established that heart attack victims are better informed.[8] Greater than half of those patients arrive at the hospital within 4 hr of symptomatology. This is well within their 6-hr window for treatment with rt-PA. Primary-care physicians have provided much of the education and encouragement necessary to achieve this measure of success, and a like effort should be made with regard to stroke recognition and treatment.

The denial of illness is a serious issue interfering with the prompt treatment of ischemic stroke. We can define it clinically as: "Avoiding the awareness of some painful aspect of reality by negating sensory data."[19] One possible solution for denial is hope, which is a belief that something meaningful can be achieved. This is particularly important in the African-American community, which has the highest mortality rate from stroke.

CONCLUSION

As the "decade of the brain" concludes and we enter a new millennium, the need for all parties

concerned to begin to treat "brain attacks" with the urgency and fervor of heart attacks has never been greater. Increased funding for stroke education research and treatment is needed. Recent statistics produced by the U.S. Department of Health and Human Services illustrated that strokes receive a disproportionate amount of research dollars per number of reported deaths when compared to AIDS, cancer, diabetes, and heart disease. Strokes are first in morbidity, third in death, but last in funding.[20]

APPENDIX

Listed below is a selection of some of the most frequent responses as given verbatim to the investigators for this study. The patient's response time is given in parentheses.

1. "Just felt a little lightheaded. Didn't really want to go to the doctor." (18 hr)
2. "For one thing I didn't want to be admitted to the hospital. For one thing I got to take care of something this Wednesday." (27 hr)
3. "I don't know." (56 hr)
4. "I didn't want to leave my car." (?)
5. "I didn't think anything was wrong. This hand feel heavy but I didn't pay any attention to it." (168 hr)
6. "I thought it would get better." (19 hr)
7. "..thought it was the blood pressure." (4 hr)
8. "I've been weak before. I thought it was because of the head injury." (4 hr)
9. "I prayed and it went away and returned one week later." (168 hr)
10. "Who is to say that something is wrong." (48 hr)
11. "I don't go to the doctor for every little thing. I thought it would get better." (36 hr)
12. "I just figured it was something that would work out until she (wife) saw something at Washington Hospital Center that said it could be a aneurysm." (90 min)
13. "Ain't nothing wrong with me. I never had that feeling before." (45 min)
14. "I thought my leg had went to sleep." (75 min)
15. "I didn't want someone to take me out and nobody know about it." (8.5 hr)
16. "I was thinking it must have been stress." (48 hr)
17. "Well I don't know it happened so fast. I sho (sic) couldn't tell you. I thought I could make it back to the house." (21 hr)

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